



ENTERED

OIPE

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/024,370

DATE: 04/12/2002

TIME: 14:26:43

Input Set : A:\21123139.app

Output Set : N:\CRF3\04122002\J024370.raw

3 <110> APPLICANT: TILG, YVONNE  
 4 ELKMANN, BERND  
 5 EGGELING, LOTHAR  
 6 SAHM, HERMANN  
 7 MOCKEL, BETTINA  
 9 <120> TITLE OF INVENTION: PROCESS FOR THE PREPARATION OF L-AMINO ACIDS BY  
 10 FERMENTATION AND NUCLEOTIDE SEQUENCES CODING FOR THE  
 11 accDA GENE  
 13 <130> FILE REFERENCE: 21123-284139-MAS  
 15 <140> CURRENT APPLICATION NUMBER: 10/024,370  
 16 <141> CURRENT FILING DATE: 2001-12-21  
 18 <150> PRIOR APPLICATION NUMBER: 09/362,899  
 19 <151> PRIOR FILING DATE: 1999-07-29  
 21 <150> PRIOR APPLICATION NUMBER: DE 199 24 365.4  
 22 <151> PRIOR FILING DATE: 1999-07-29  
 24 <160> NUMBER OF SEQ ID NOS: 3  
 26 <170> SOFTWARE: PatentIn Ver. 2.1  
 28 <210> SEQ ID NO: 1  
 29 <211> LENGTH: 2123  
 30 <212> TYPE: DNA  
 31 <213> ORGANISM: Corynebacterium glutamicum  
 33 <220> FEATURE:  
 34 <221> NAME/KEY: gene  
 35 <222> LOCATION: (508)..(1980)  
 36 <223> OTHER INFORMATION: accDA  
 38 <400> SEQUENCE: 1  
 39 ctcgagcggg agtcggtgat cggccactct ctaagcaatg ccggctttaa aataaagcaa 60  
 40 cttatatgtt tctcaccaca tctggccgac gaccacgaag tatgttgctg atcacagcta 120  
 41 aacgtgtgaa tgtgaagtta cctaactcac attgcaatgc gatagcgatt tggaaaactc 180  
 42 actcccccca atatcttaac ttaaacttaa aagtagtggt ttacctgcat ttataaaagt 240  
 43 tcccgatcta cccctctttt accccgaaat accccttttg caaagattgc aaacacaaca 300  
 44 gtgcaatagt taacgggctt cacacgtcac cattctgtcc ggttttaggc tatgttcggg 360  
 45 acgtctaggc aaaaagtagt tttgtgagat gaaacgcata atccgtcatt ttttacgcaa 420  
 46 tcgatagcct aaattgggct tagatcttcc gcctctaaat aggtatgcag agacattcga 480  
 47 attaatgaac aaagccattt ttcggccggtg gagaagcgtt ttccgactat ggtgtggggc 540  
 48 atggaacaca cttcagcatt gacgctcata gactcgggtt tggaccctga cagcttcatt 600  
 49 tcttggaatg aaactcccca atatgacaac ctcaatcaag gctatgcaga gaccttggag 660  
 50 cgggctcgaa gcaaggccaa atgcgatgaa tcggtaatta ctggagaagg caccgtggag 720  
 51 ggcattccgg tagccgttat tttgtccgat ttttcccttc tcggcggttc tttgggcacg 780  
 52 gtcgcgctcg tgcgcatcat gaaggcgatt caccgcgcca cagagctgaa actcccactg 840  
 53 ctgggtctccc ctgcttccgg tgggtgcgcgc atgcaggaag acaatcgagc ttttgtcatg 900  
 54 atgggtgtcca taaccgcggc tgtgcagcgt caccgcgagg cgcatttgcc gttcctggtg 960  
 55 tatttgcgca atcccacgat ggggtggcgcc atggcctcgt ggggttcacg tgggcatctc 1020

## RAW SEQUENCE LISTING

DATE: 04/12/2002

PATENT APPLICATION: US/10/024,370

TIME: 14:26:43

Input Set : A:\21123139.app

Output Set: N:\CRF3\04122002\J024370.raw

```

56 acttttgcgg aacccggcgc gcagataggt ttcctgggtc ctgcgctggt ggagttaacc 1080
57 actgggcatg cgtttccaga cgggtgtgcag caggcggaga atttggtgaa aactggtgtg 1140
58 attgatggaa ttgtgtcgcc actccaattg cgtgcagcgg tggcaaaaac cctcaagggt 1200
59 attcagccgg tagaggcaac ggatcgtttt tctccaacaa ctcttgccgt ggcaattccg 1260
60 gtgatggagg cgattgcgcg ttctcgtgac ccgcagaggg ctggaatcgg ggagattatg 1320
61 gaaacgttgg gggcagacgt cgtcaagctt tctggtgcgc gtgctggcgc attgagcccg 1380
62 gctgtgcgcg ttgccctggc gcgcacgcgg ggccggcccg tgggtgctgat tgggcaggat 1440
63 cgccgcttca cgtttgggccc gcaggagctg cgttttgcgc gtcgtggcat ttgctggcg 1500
64 cgcgagctaa acctgccgat cgtgtccatc atcgacacct ccggcgccga attgtgcag 1560
65 gcggctgagg agctcggcat cgcaagctcg attgcgcgca ccttgccaa gcttatcgac 1620
66 gctccctcc ccaccgttcc ggtcattatt ggtcagggcg ttggcggtgg cgcgctggcc 1680
67 atgctgccc cccatctggt ctacgcggcc gaaaacgcgt ggctgtccgc attgccacca 1740
68 gagggcgcc cggccatcct cttccgcgac accaaccacg ccgcggaaat catagagcga 1800
69 caaggcgtgc aggcgcacgc acttttaagc caagggtta tgcagggat cgtgcgcgaa 1860
70 accgagcaat ttgttgaaga aattctcgcc acaatcagca acgcccctc cgaattggat 1920
71 aacaatccgg agagggcggg acgcgacagt cgtttcacac gatttgagcg tttagcgcag 1980
72 taaagaaaat tatgcgctga tcaaatcgat gatgaacacc agggtagcgc cagacagtgg 2040
73 gtggccggaa cctcagggc cgtaagcagc ctctggcgga atggtcagct gacgacgtcc 2100
74 gccgaccttc atgctggaa ttc                                     2123

```

77 &lt;210&gt; SEQ ID NO: 2

78 &lt;211&gt; LENGTH: 1473

79 &lt;212&gt; TYPE: DNA

80 &lt;213&gt; ORGANISM: Corynebacterium glutamicum

82 &lt;220&gt; FEATURE:

83 &lt;221&gt; NAME/KEY: CDS

84 &lt;222&gt; LOCATION: (1)..(1473)

85 &lt;223&gt; OTHER INFORMATION: accDA

87 &lt;400&gt; SEQUENCE: 2

```

88 gtg gag aag cgt ttt ccg act atg gtg tgg ggc atg gaa cac act tca 48
89 Val Glu Lys Arg Phe Pro Thr Met Val Trp Gly Met Glu His Thr Ser
90 1 5 10 15
92 gca ttg acg ctc ata gac tcg gtt ttg gac cct gac agc ttc att tct 96
93 Ala Leu Thr Leu Ile Asp Ser Val Leu Asp Pro Asp Ser Phe Ile Ser
94 20 25 30
96 tgg aat gaa act ccc caa tat gac aac ctc aat caa ggc tat gca gag 144
97 Trp Asn Glu Thr Pro Gln Tyr Asp Asn Leu Asn Gln Gly Tyr Ala Glu
98 35 40 45
100 acc ttg gag cgg gct cga agc aag gcc aaa tgc gat gaa tcg gta att 192
101 Thr Leu Glu Arg Ala Arg Ser Lys Ala Lys Cys Asp Glu Ser Val Ile
102 50 55 60
104 act gga gaa ggc acc gtg gag ggc att ccg gta gcc gtt att ttg tcc 240
105 Thr Gly Glu Gly Thr Val Glu Gly Ile Pro Val Ala Val Ile Leu Ser
106 65 70 75 80
108 gat ttt tcc ttc ctc ggc ggt tct ttg ggc acg gtc gcg tcg gtg cgc 288
109 Asp Phe Ser Phe Leu Gly Gly Ser Leu Gly Thr Val Ala Ser Val Arg
110 85 90 95
112 atc atg aag gcg att cac cgc gcc aca gag ctg aaa ctc cca ctg ctg 336
113 Ile Met Lys Ala Ile His Arg Ala Thr Glu Leu Lys Leu Pro Leu Leu
114 100 105 110

```

## RAW SEQUENCE LISTING

PATENT APPLICATION: US/10/024,370

DATE: 04/12/2002

TIME: 14:26:43

Input Set : A:\21123139.app

Output Set: N:\CRF3\04122002\J024370.raw

116	gtc	tcc	cct	gct	tcc	ggt	ggt	gcg	cgc	atg	cag	gaa	gac	aat	cga	gct	384
117	Val	Ser	Pro	Ala	Ser	Gly	Gly	Ala	Arg	Met	Gln	Glu	Asp	Asn	Arg	Ala	
118			115					120					125				
120	ttt	gtc	atg	atg	gtg	tcc	ata	acc	gcg	gct	gtg	cag	cgt	cac	cgc	gag	432
121	Phe	Val	Met	Met	Val	Ser	Ile	Thr	Ala	Ala	Val	Gln	Arg	His	Arg	Glu	
122		130					135					140					
124	gcg	cat	ttg	ccg	ttc	ctg	gtg	tat	ttg	cgc	aat	ccc	acg	atg	ggt	ggc	480
125	Ala	His	Leu	Pro	Phe	Leu	Val	Tyr	Leu	Arg	Asn	Pro	Thr	Met	Gly	Gly	
126	145					150				155						160	
128	gcc	atg	gcc	tcg	tgg	ggt	tca	tct	ggg	cat	ctc	act	ttt	gcg	gaa	ccc	528
129	Ala	Met	Ala	Ser	Trp	Gly	Ser	Ser	Gly	His	Leu	Thr	Phe	Ala	Glu	Pro	
130				165				170							175		
132	ggc	gcg	cag	ata	ggt	ttc	ctg	ggt	cct	cgc	gtg	gtg	gag	tta	acc	act	576
133	Gly	Ala	Gln	Ile	Gly	Phe	Leu	Gly	Pro	Arg	Val	Val	Glu	Leu	Thr	Thr	
134			180					185					190				
136	ggg	cat	gcg	ctt	cca	gac	ggt	gtg	cag	cag	gcg	gag	aat	ttg	gtg	aaa	624
137	Gly	His	Ala	Leu	Pro	Asp	Gly	Val	Gln	Gln	Ala	Glu	Asn	Leu	Val	Lys	
138			195				200					205					
140	act	ggt	gtg	att	gat	gga	att	gtg	tcg	cca	ctc	caa	ttg	cgt	gca	gcg	672
141	Thr	Gly	Val	Ile	Asp	Gly	Ile	Val	Ser	Pro	Leu	Gln	Leu	Arg	Ala	Ala	
142		210				215						220					
144	gtg	gca	aaa	acc	ctc	aag	gtt	att	cag	ccg	gta	gag	gca	acg	gat	cgt	720
145	Val	Ala	Lys	Thr	Leu	Lys	Val	Ile	Gln	Pro	Val	Glu	Ala	Thr	Asp	Arg	
146	225				230					235						240	
148	ttt	tct	cca	aca	act	cct	ggc	gtg	gca	ctt	ccg	gtg	atg	gag	gcg	att	768
149	Phe	Ser	Pro	Thr	Thr	Pro	Gly	Val	Ala	Leu	Pro	Val	Met	Glu	Ala	Ile	
150				245				250					255				
152	gcg	cgt	tct	cgt	gac	ccg	cag	agg	cct	gga	atc	ggg	gag	att	atg	gaa	816
153	Ala	Arg	Ser	Arg	Asp	Pro	Gln	Arg	Pro	Gly	Ile	Gly	Glu	Ile	Met	Glu	
154			260					265					270				
156	acg	ttg	ggg	gca	gac	gtc	gtc	aag	ctt	tct	ggt	gcg	cgt	gct	ggc	gca	864
157	Thr	Leu	Gly	Ala	Asp	Val	Val	Lys	Leu	Ser	Gly	Ala	Arg	Ala	Gly	Ala	
158			275					280					285				
160	ttg	agc	ccg	gct	gtg	cgc	gtt	gcc	ctg	gcg	cgc	atc	ggg	ggc	cgg	ccc	912
161	Leu	Ser	Pro	Ala	Val	Arg	Val	Ala	Leu	Ala	Arg	Ile	Gly	Gly	Arg	Pro	
162		290				295						300					
164	gtg	gtg	ctg	att	ggg	cag	gat	cgc	cgc	ttc	acg	ctt	ggg	ccg	cag	gag	960
165	Val	Val	Leu	Ile	Gly	Gln	Asp	Arg	Arg	Phe	Thr	Leu	Gly	Pro	Gln	Glu	
166	305				310					315					320		
168	ctg	cgt	ttt	gcg	cgt	cgt	ggc	att	tcg	ctg	gcg	cgc	gag	cta	aac	ctg	1008
169	Leu	Arg	Phe	Ala	Arg	Arg	Gly	Ile	Ser	Leu	Ala	Arg	Glu	Leu	Asn	Leu	
170				325				330							335		
172	ccg	atc	gtg	tcc	atc	gac	acc	tcc	ggc	gcc	gaa	ttg	tcg	cag	gcg		1056
173	Pro	Ile	Val	Ser	Ile	Ile	Asp	Thr	Ser	Gly	Ala	Glu	Leu	Ser	Gln	Ala	
174			340					345					350				
176	gct	gag	gag	ctc	ggc	atc	gca	agc	tcg	att	gcg	cgc	acc	ttg	tcc	aag	1104
177	Ala	Glu	Glu	Leu	Gly	Ile	Ala	Ser	Ser	Ile	Ala	Arg	Thr	Leu	Ser	Lys	
178			355				360					365					
180	ctt	atc	gac	gct	ccc	ctc	ccc	acc	gtt	tcg	gtc	att	att	ggt	cag	ggc	1152

## RAW SEQUENCE LISTING

DATE: 04/12/2002

PATENT APPLICATION: US/10/024,370 . . . TIME: 14:26:43

Input Set : A:\21123139.app

Output Set: N:\CRF3\04122002\J024370.raw

```

181 Leu Ile Asp Ala Pro Leu Pro Thr Val Ser Val Ile Ile Gly Gln Gly
182      370                      375                      380
184 gtt ggc ggt ggc gcg ctg gcc atg ctg ccc gcc gat ctg gtc tac gcg 1200
185 Val Gly Gly Gly Ala Leu Ala Met Leu Pro Ala Asp Leu Val Tyr Ala
186 385                      390                      395                      400
188 gcc gaa aac gcg tgg ctg tcc gca ttg cca cca gag ggc gcc tcg gcc 1248
189 Ala Glu Asn Ala Trp Leu Ser Ala Leu Pro Pro Glu Gly Ala Ser Ala
190      405                      410                      415
192 atc ctc ttc cgc gac acc aac cac gcc gcg gaa atc ata gag cga caa 1296
193 Ile Leu Phe Arg Asp Thr Asn His Ala Ala Glu Ile Ile Glu Arg Gln
194      420                      425                      430
196 ggc gtg cag gcg cac gca ctt tta agc caa ggg ctt atc gac ggg atc 1344
197 Gly Val Gln Ala His Ala Leu Leu Ser Gln Gly Leu Ile Asp Gly Ile
198      435                      440                      445
200 gtc gcc gaa acc gag cac ttt gtt gaa gaa att ctc ggc aca atc agc 1392
201 Val Ala Glu Thr Glu His Phe Val Glu Glu Ile Leu Gly Thr Ile Ser
202      450                      455                      460
204 aac gcc ctc tcc gaa ttg gat aac aat ccg gag agg gcg gga cgc gac 1440
205 Asn Ala Leu Ser Glu Leu Asp Asn Asn Pro Glu Arg Ala Gly Arg Asp
206 465                      470                      475                      480
208 agt cgc ttc aca cga ttt gag cgt tta gcg cag 1473
209 Ser Arg Phe Thr Arg Phe Glu Arg Leu Ala Gln
210      485                      490
213 <210> SEQ ID NO: 3
214 <211> LENGTH: 491
215 <212> TYPE: PRT
216 <213> ORGANISM: Corynebacterium glutamicum
218 <400> SEQUENCE: 3
219 Val Glu Lys Arg Phe Pro Thr Met Val Trp Gly Met Glu His Thr Ser
220 1 5 10 15
222 Ala Leu Thr Leu Ile Asp Ser Val Leu Asp Pro Asp Ser Phe Ile Ser
223 20 25 30
225 Trp Asn Glu Thr Pro Gln Tyr Asp Asn Leu Asn Gln Gly Tyr Ala Glu
226 35 40 45
228 Thr Leu Glu Arg Ala Arg Ser Lys Ala Lys Cys Asp Glu Ser Val Ile
229 50 55 60
231 Thr Gly Glu Gly Thr Val Glu Gly Ile Pro Val Ala Val Ile Leu Ser
232 65 70 75 80
234 Asp Phe Ser Phe Leu Gly Gly Ser Leu Gly Thr Val Ala Ser Val Arg
235 85 90 95
237 Ile Met Lys Ala Ile His Arg Ala Thr Glu Leu Lys Leu Pro Leu Leu
238 100 105 110
240 Val Ser Pro Ala Ser Gly Gly Ala Arg Met Gln Glu Asp Asn Arg Ala
241 115 120 125
243 Phe Val Met Met Val Ser Ile Thr Ala Ala Val Gln Arg His Arg Glu
244 130 135 140
246 Ala His Leu Pro Phe Leu Val Tyr Leu Arg Asn Pro Thr Met Gly Gly
247 145 150 155 160
249 Ala Met Ala Ser Trp Gly Ser Ser Gly His Leu Thr Phe Ala Glu Pro

```

## RAW SEQUENCE LISTING

DATE: 04/12/2002

PATENT APPLICATION: US/10/024,370

TIME: 14:26:43

Input Set : A:\21123139.app

Output Set: N:\CRF3\04122002\J024370.raw

```

250          165          170          175
252 Gly Ala Gln Ile Gly Phe Leu Gly Pro Arg Val Val Glu Leu Thr Thr
253          180          185          190
255 Gly His Ala Leu Pro Asp Gly Val Gln Gln Ala Glu Asn Leu Val Lys
256          195          200          205
258 Thr Gly Val Ile Asp Gly Ile Val Ser Pro Leu Gln Leu Arg Ala Ala
259          210          215          220
261 Val Ala Lys Thr Leu Lys Val Ile Gln Pro Val Glu Ala Thr Asp Arg
262 225          230          235          240
264 Phe Ser Pro Thr Thr Pro Gly Val Ala Leu Pro Val Met Glu Ala Ile
265          245          250          255
267 Ala Arg Ser Arg Asp Pro Gln Arg Pro Gly Ile Gly Glu Ile Met Glu
268          260          265          270
270 Thr Leu Gly Ala Asp Val Val Lys Leu Ser Gly Ala Arg Ala Gly Ala
271          275          280          285
273 Leu Ser Pro Ala Val Arg Val Ala Leu Ala Arg Ile Gly Gly Arg Pro
274          290          295          300
276 Val Val Leu Ile Gly Gln Asp Arg Arg Phe Thr Leu Gly Pro Gln Glu
277 305          310          315          320
279 Leu Arg Phe Ala Arg Arg Gly Ile Ser Leu Ala Arg Glu Leu Asn Leu
280          325          330          335
282 Pro Ile Val Ser Ile Ile Asp Thr Ser Gly Ala Glu Leu Ser Gln Ala
283          340          345          350
285 Ala Glu Glu Leu Gly Ile Ala Ser Ser Ile Ala Arg Thr Leu Ser Lys
286          355          360          365
288 Leu Ile Asp Ala Pro Leu Pro Thr Val Ser Val Ile Ile Gly Gln Gly
289          370          375          380
291 Val Gly Gly Gly Ala Leu Ala Met Leu Pro Ala Asp Leu Val Tyr Ala
292 385          390          395          400
294 Ala Glu Asn Ala Trp Leu Ser Ala Leu Pro Pro Glu Gly Ala Ser Ala
295          405          410          415
297 Ile Leu Phe Arg Asp Thr Asn His Ala Ala Glu Ile Ile Glu Arg Gln
298          420          425          430
300 Gly Val Gln Ala His Ala Leu Leu Ser Gln Gly Leu Ile Asp Gly Ile
301          435          440          445
303 Val Ala Glu Thr Glu His Phe Val Glu Glu Ile Leu Gly Thr Ile Ser
304          450          455          460
306 Asn Ala Leu Ser Glu Leu Asp Asn Asn Pro Glu Arg Ala Gly Arg Asp
307 465          470          475          480
309 Ser Arg Phe Thr Arg Phe Glu Arg Leu Ala Gln
310          485          490

```

**VERIFICATION SUMMARY**

PATENT APPLICATION: US/10/024,370

DATE: 04/12/2002

TIME: 14:26:44

Input Set : A:\21123139.app

Output Set: N:\CRF3\04122002\J024370.raw